

REGENERATION OF THE DISTAL PHALANX

A case report

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A patient who suffered a traumatic avulsion of the distal phalanx of the right index finger is described. Following simple wound toilet and closure, the distal phalanx regenerated to give an excellent functional result.

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A 9-year-old boy sustained a laceration over the dorsum of the right index finger when he caught it on a piece of wire, as he fell from his bicycle.

He had a dirty, L-shaped laceration on the radial side of the dorsum of the distal phalanx, extending from the DIP joint towards the side of the nail. There was also a typical mallet deformity. The nail and nailbed appeared to be intact.

An X-ray of the hand showed complete absence of the distal phalanx in the traumatised fingertip (Fig 1).

During débridement of the wound, it was noted that there were some tiny shreds of periosteal tissue. There was also an avulsed extensor tendon, with no bone attached to it. The wound was sutured with antibiotic cover. Apart from some local inflammation, healing was uneventful. When the sutures were removed at 10 days, the nail remained healthy and the mallet deformity persisted.

The patient was seen 3 and 6 months later, when, surprisingly, examination revealed slight extensor lag and a nearly normal looking finger (Fig 2). Flexion and



Fig 1 (a & b) X-rays taken on admission showing absence of the distal phalanx.

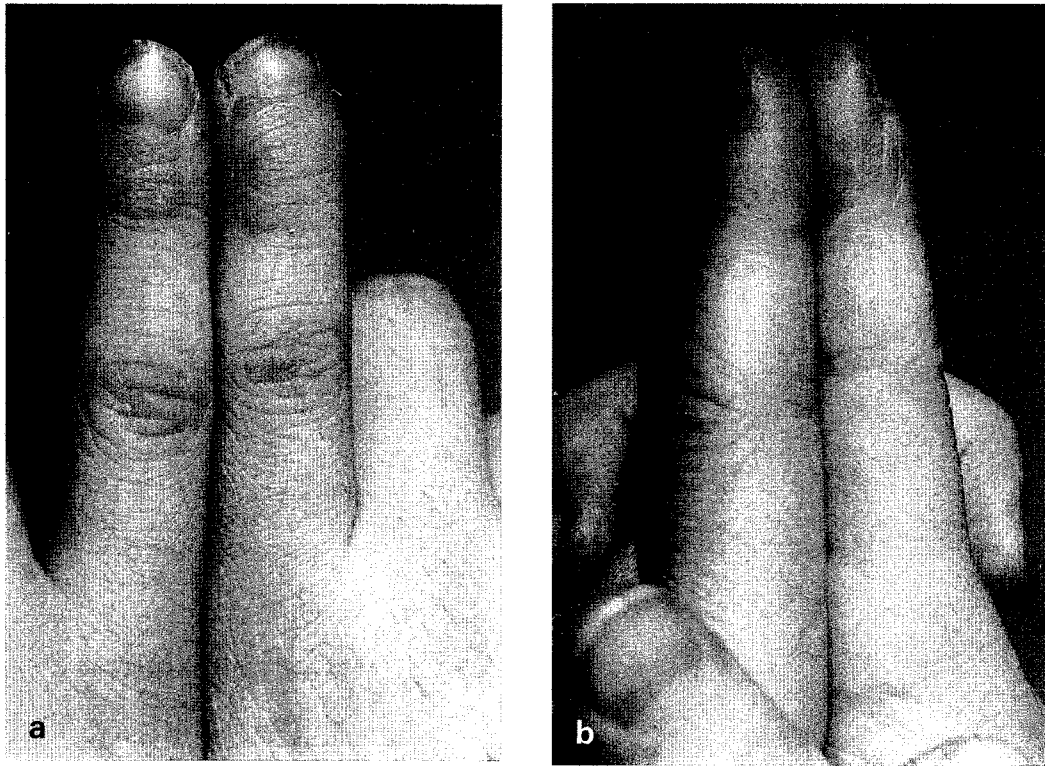


Fig 2 (a & b) Photographs at 6 months of the injured right index finger, with the left index finger for comparison.

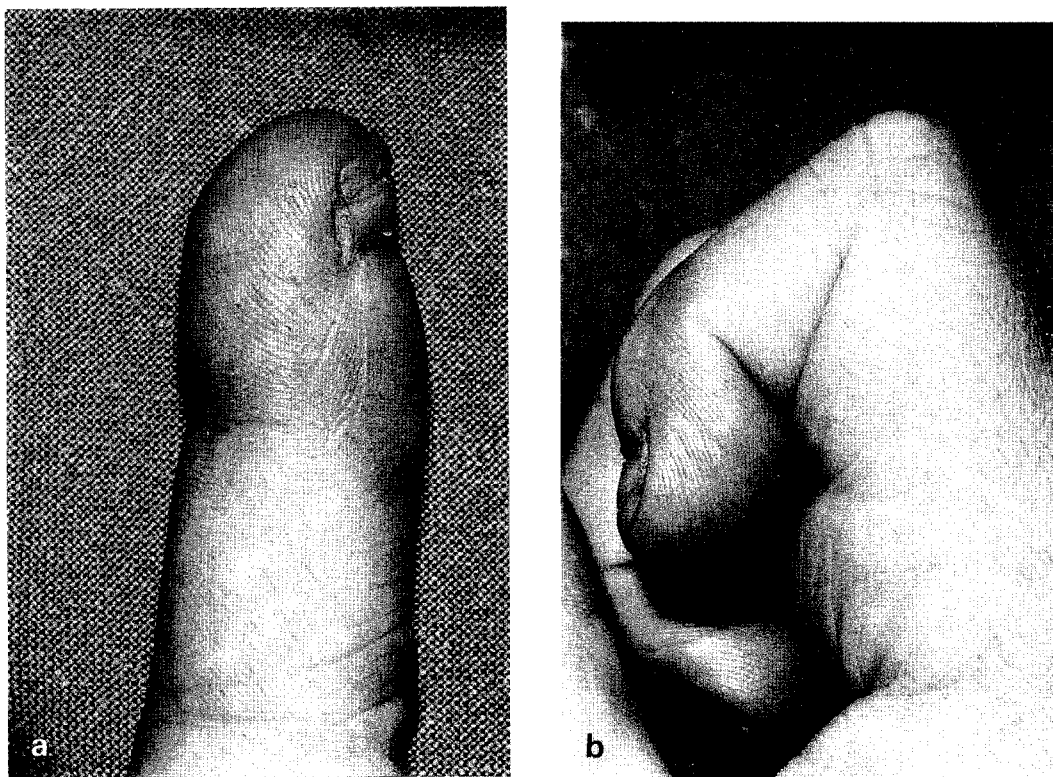


Fig 3 (a & b) Close up of the injured finger showing range of extension and flexion.



Fig 4 (a & b) X-ray of the finger 6 months after the injury, showing regeneration of the distal phalanx.

extension were from 15° to 90° compared to 0° to 110° on the opposite side (Fig 3).

X-ray examination showed a regenerated distal phalanx which looked remarkably normal apart from an absent epiphysis. A small notch on the head of the middle phalanx was noted (Fig 4).

DISCUSSION

Since the early studies of Douglas (1972) and Illingworth (1974) it has been known that finger-tip amputations in children heal very well, and the lost tissues can partially regenerate if treated conservatively.

Douglas (1972) showed that bone exposure does not lead to osteomyelitis and occasionally there was some lengthening of the exposed bone with subsequent skin advancement from the periphery.

Formation of new bone in the presence of intact periosteum can be observed in many circumstances,

when, for example, a rib bone graft is harvested in a subperiosteal manner. Bone lengthening procedures that use gradual distraction rely on the formation of new bone that derives in part from periosteal tissues (Matev, 1979; Dobyns et al, 1988).

Our case is unusual in that the distal phalanx was avulsed with preservation of the soft tissue coverings including the nail bed. The new distal phalanx presumably regenerated from periosteal remnants within the wound. The reattachment of the extensor and flexor tendons allowing a nearly normal range of flexion and extension is perhaps surprising.

The fact that the phalanx has regenerated without an epiphysis will probably mean that growth will be impaired; long-term follow up will be required to assess this. We have been unable to find reports of a similar case in the literature. It emphasises the benefit of a conservative approach to finger-tip injuries, particularly in children.

References

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